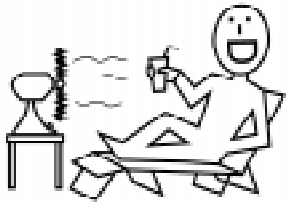
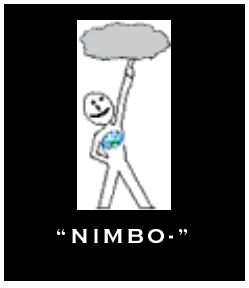


S'COOL BREEZE

Student's Cloud Observations On-Line

Volume 2 , Issue 1 March 2001

Inside this issue:



'On Line' at Greenwich

by Carolyn Green, Educational Consultant for S'COOL, NASA Langley Research Center, Hampton, Virginia.

Carolyn Green is 'On-line'.

This report comes to you 'On line,' or rather, on the Prime Meridian at Greenwich, England. What is so significant about this imaginary line that runs north-south through Greenwich, England? It was named as the world's Longitude Zero by the International Meridian Conference in 1884. It has become the center of time and space, but how did it come to be?

In ancient times early mariners were able to roughly determine the Earth's size and establish certain surface co-ordinates relative to the equator by watching the movement of the Sun and the stars. They called those co-ordinates lines of latitude. Determining east-west co-ordinates was a more difficult task. When explorers began their search for new worlds in the 15th century, an educated guess as to their location frequently resulted with shipwrecks and tragedy.

Charles II, King of England, was anxious to preserve his royal fleet and so established the Royal Observatory and appointed James Flamsteed as the first Astronomer Royal in 1674. It was his task to study the heavens and determine the longitude of places in order to enable a safer navigation for the king's ships.

"Both longitude and latitude are

(Continued on page 2)

Through rain, sleet and SNOW – Students Observe!

When posed the question: "Do your students go out in the snow to observe?" Carol Van De Walle responded, "Yes, we even went out twice today! They are especially enjoying a chance to get out into the snow, we've had a little over 19 in. this month, 5 in. yesterday. …. We have been learning how to measure relative humidity and the crucial need for recognizing numbers that just don't fit-one group had a 98% humidity in the room today so we were trying to learn to think about 'does this seem reasonable?'. I think they are beginning to make progress! As a result of our sending information one student asked if the relative humidity was related to how well the snow packed or if it was fluffy. We are now collecting data to

(Continued on page 3)

On-Line' in Greenwich *(continued from page 1)*
measured as segments of a 360^0 circle, in degrees, minutes and seconds. Since the Earth turns one complete rotation, or 360^0, every 24 hours, the segments of that rotation can be divided into portions of time. 360^0 equals 24 hours, 180^0 equals 12 hours, 15^0 equals 1 hour, 1^0 equals 4 minutes of time." If you know the difference in time between two different places, you will know the difference in longitude. If a navigator believes he is three hours from Greenwich he is also 45 degrees east or west of Greenwich. A good sea going clock was needed to withstand the extremes in temperature and the rolling motions of the sea itself. As a result, the Board of Longitude in 1714 offered a prize to anyone who could discover a way to determine longitude at sea to within half a degree.

The Royal Observatory in Greenwich, England.

"Since the Earth turns one complete rotation, or 360^0, every 24 hours, the segments of that rotation can be divided into portions of time."

Back at the Royal Observatory Flamsteed would line up a refracting telescope with a meridian, observe the rotating stars overhead and time the intervals of the Earth's rotation precisely in order to accurately map the night sky. The need to accurately time the movement of the stars led to more and more accurate development of clocks.

Each time a new or better telescope was secured, a new wing of the observatory would be added to accommodate it; always in line with the original meridian but slightly further east. Three meridians followed Flamsteed's original. They were the lines of the Astronomer Royals' Halley, Bradley and Airy, who followed Flamsteed. The last was recognized in 1884 as the Prime Meridian of the world.

Until the mid 1800's every town kept its own local time based on setting their watches at noon as the sun reached its zenith. The problem with that arose with the development of the railroads. With each local depot setting its own time, timetables were a nightmare. Communicating by telegraph escalated the problem, for now all major cities were in direct contact with one another at any time.

Since the Royal Observatory had a long standing reputation of precision timekeeping in Britain, and the need for a standard time had become increasingly important, the British Standard Time became official August 2, 1880. The problem extended far beyond England's borders however, and much discussion ensued to determine where the "Prime Meridian of the World" should be located. Finally delegates from 25 countries met in Washington D.C. and agreed that the Observatory at Greenwich, England would be the location of the 'initial meridian.' There were two main reasons why Greenwich was chosen. The United States was already using Greenwich time, and, as England was quick to point out, 72% of the world's shipping was dependent on sea-charts, which used Greenwich as the Prime Meridian. Therefore, the least number of people would be inconvenienced by choosing Greenwich.

Today the accuracy of time is monitored by atomic clocks, and we are no longer dependent on sextants, telescopes and quadrants to determine our location. One can use the Global Positioning System (GPS) to determine their position by beaming up to one of the global positioning satellites. Nevertheless, there is something rather magical about walking that "historical line" at high noon, realizing that all the world acknowledged that here would be the center of time and space. •

"The Story of Time and Space", Kristin Lippincott, Tick Tock Publishing,Ltd. 1999

...SNOW, Students Observe *(Continued from page 1)*
try to find an answer. It is really exciting to see children begin to think about the connections associated with the observations we are making."

Connections are being made with students observing for the S'COOL Project. Teachers continue to share the many ways that students are getting excited about science as they look up and study the sky . See the "Let's Connect " link on the S'COOL webpage where a number of teachers have shared creative ideas from their classroom.

Encourage your students' curiosity. Whether it is a question about fluffy snow or streaming contrails, great science often begins with a simple question. What questions are your students asking? Be ready to explore with them. •

Post one of your "S'COOL Moments", a question or an idea on the message board . As the link reads,

Let's Connect!

Carol Van De Walle's 5-6 grade Class, Audubon Elementary, Rock Island, Illinois.

Taking a closer look!

Enjoying the snow!
Mrs. Van De Walle's class 'on-line' - on a SNOW line.

Sun Time, Fun Time

On your next clear sunny day, challenge your students to make a sundial using the materials listed below. This activity may be done outside or by a windowsill that gets sunlight most of the day.

Short pencil or dowel
Clay
Piece of paper
Watch or clock

See if your students can make a sundial that will keep time on the next sunny day.

Need some instructions?
Follow these or a variation of these.

Using a pencil and some clay as a base, mount the pencil upright on a blank piece of paper. This will be the center of your circle. Draw a semicircle around this point using the length of the pencil as the radius. As the pencil casts its shadow on the paper, mark the position of the shadow every hour where it crosses the semicircle.

• Try this activity before and after Daylight Savings Time. What changes would need to be made to their sundial? Why?

• Would their sundial work in a different time zone?

"It is really exciting to see children begin to think about the connections associated with the observations we are making."

Teacher Corner

Fall Survey results are now available on-line! *Thank you to all who sent in a survey.*

Remember Daylights Savings Time.
Spring ahead, *April 1 in most of the USA.*

Plan on observing with S'COOL for our next IOP during the week of April 1-7.

Join S'COOL in Celebrating Sun-Earth Day on April 27. *Watch the website on how your class might be involved the week prior.*

700 sites registered with S'COOL across the globe.

Observer stickers will be sent out in May.

Thank you for your participation!

NASA Langley Research Center
CERES S'COOL Project
Mail Stop 420
Hampton, VA 23681-2199

Upcoming Events

S'COOL Presentations
Satellites and Technology Conference , West Chester, PA March 7 - 9, '01
NSTA, St. Louis, MO, March 22-25, '01
Intensive Observation Period
April 1-7, 2001
Sun-Earth Day, April 27, 2001
Aqua Launch, July 2001
Summer S'COOL Workshop, July '2001

For more information contact us by:
S'COOL Project
Mail Stop 420
NASA Langley Research Center
Hampton, VA 23681-2199
Phone:(757) 864-5682
FAX: (757) 864-7996
E-mail: scool@larc.nasa.gov
Http://scool.larc.nasa.gov
Douglas Stoddard, editor
Stephanie Weckmann, French translator
Roberto Sepulveda, Spanish translator

Summer S'COOL Workshop
July 16-20, 2001

Selected Participants will be introduced to the S'COOL program and its connection to learning standards. They will work cooperatively in developing new materials related to the project. In addition participating teachers will be provided materials, field trips and a stipend. Teachers in grades 3-9 may apply. The workshop will be limited to 20 participants. Offer is available to teachers in all 50 US states. Complete applications must be received by **March 31, 2001**. Application forms available on-line.

See Photo Album on-line for pictures from last year's workshop. (Under News and reviews)